**TOF Protocol**

version 1.0

Message structure

',' separates fields

msg\_type,data\_length,data, ... \r\n

msg\_type - see below

data\_length - number of data fields in the message

data ...

\r\n - End of message indicator

**TOF to Roborio:**

msg\_type

0 - reserved

1 - range determination

2 - histogram

3 - arm angle

4 - raw pixel data

range determination message:

data[0]:

0 - target not present

1 - target in range

2 - target too far

3 - target too close

data[1]: range in mm

histogram message:

data[0] - data[10]: # of pixels with the range of each bucket

arm angle message:

data[0]: angle in 0.1 degrees

**Roborio to TOF:**

0 - reserved

1 - target type

2 - histogram on/off (1/0)

3 - arm angle offset in 0.1 degrees

4 - raw pixel data on/off (1/0)

target type message:

data[0]:

0 - cone

1 - cube

arm angle offset message:

data[0]: angle in 0.1 degrees

**Examples:**

**TOF to Roborio examples:**

msg\_type

0 - reserved

1 - range determination

1,2,1,500

1,2,2,1000

2 - histogram

2,11,0,0,20,30,10,4,0,0,0,0

3 - arm angle

3,1,457

4 - raw pixel data

4,64,1388,743,0,2494,841,986,472,0,1227,390,1095,2820,1060,1376,977,4376,1356,1881,2779,2817,2847,0,2814,2917,1394,0,2614,2559,2619,2622,2611,2638,1319,0,2598,2551,20

**Roborio to TOF examples:**

msg\_type

0 - reserved

1 - target type

1,1,0

1,1,1

2 - histogram on/off

2,1,0

2,1,1

3 - arm angle offset

3,1,326

3,1,53

4 - raw pixel data on/off

4,1,1

4,1,0